EMC TEST REPORT

ETSI EN 301 489-1V1.9.2:2011

ETSI EN 301 489-3 V1.4.1:2002

EN 55022:2010 Class B

Product:	Adapter
Trade Name:	SONTE
Model Name:	S70RPL001H
Serial Model:	S70RPL001L, S36RPL001H, S36RPL001L
Report No.:	STT20140114118E

Prepared for

SONTE Limited

Unit 1205-1208, Smartspace 2, Cyberport 2, 100 Cyberport Road, Pokfulam, Hong Kong

Prepared by

Shenzhen STONE Testing Technology Co., Ltd.

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TEST RESULT CERTIFICATION

Applicant's name ..... :	SONTE Limited
Address ..... :	Unit 1205-1208, Smartspace 2, Cyberport 2, 100 Cyberport Road, Pokfulam, Hong Kong
Manufacture's Name ..... :	SONTE Limited
Address ..... :	Unit 1205-1208, Smartspace 2, Cyberport 2, 100 Cyberport Road, Pokfulam, Hong Kong
Product description	
Product name ..... :	Adapter
Trademark ..... :	SONTE
Model and/or type ..... :	S70RPL001H
Serial Model:	S70RPL001L, S36RPL001H, S36RPL001L
Rating(s) ..... :	Adapter: Input:120/230Vac, 50/60Hz Output: 70Vac, 300mA, 40W Max. Remote: 12V23A(Alkaine battery)
Standards ..... :	ETSI EN 301 489-1V1.9.2:2011 ETSI EN 301 489-3 V1.4.1:2002 EN 55022:2010 Class B

This device described above has been tested by Shenzhen STT, and the test results show that the equipment under test (EUT) is in compliance with the 1999/5/EC R&TTE Directive Art.3.1(b) requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test ..... :	
Date (s) of performance of tests ..... :	2014-01-22
Date of Issue ..... :	2014-01-23
Test Result ..... :	**Pass**

Testing by : Linna Liu Date : 2014-01-23
(Linna Liu)

Check by : Andy Huang Date : 2014-01-24
(Andy Huang)

Approved by : Ethan Chen Date : 2014-01-24
(Ethan Chen)

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1. General Information

1.1 Client Information

Applicant : SONTE Limited

Address : Unit 1205-1208, Smartspace 2, Cyberport 2, 100 Cyberport Road, Pokfulam, Hong Kong

Manufacturer : SONTE Limited

Address : Unit 1205-1208, Smartspace 2, Cyberport 2, 100 Cyberport Road, Pokfulam, Hong Kong

1.2 General Description of EUT (Equipment Under Test)

EUT Name	**:**	Adapter	
Model No.	**:**	S70RPL001H	
Model difference	**:**	S70RPL001L, S36RPL001H, S36RPL001L	
Product Description	**:**	Operation Frequency: 433.92 MHz	
		Number of Channel:	1 Channel
		Out Power:	-5.24 dBm
		Antenna Gain:	2 dBi
		Antenna Type:	Intergral Antenna
		Modulation Type:	ASK
Power Supply	**:**	AC Power	
Power Rating	**:**	Adapter: Input:120/230Vac, 50/60Hz Output: 70Vac, 300mA, 40W Max. Remote: 12V23A(Alkaine battery)	
Connecting I/O Port(S)	**:**	Please refer to the User's Manual	

Note:

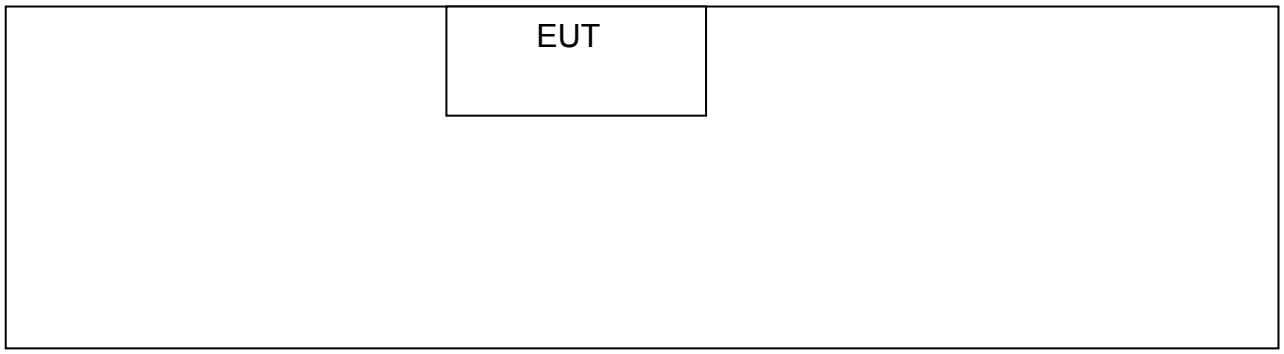
(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(2) This Test Report is EN 301489 for SRD of 433 transmitter, under R&TTE Directive Article 3.1(b).

(3) Antenna information is provided by the applicant.

1.3 Block Diagram Showing the Configuration of System Tested

Mode 1: RF Link Mode



1.4 Description of Support Units

Equipment Information				
Name	Model	S/N	Manufacturer	Used " √ "
/	/	/	/	/
Cable Information				
/	/	/	/	/

1.5 Description of Operating Mode

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	**Description**
Mode 1	RF Link Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as Following:

For EMI Test	
Final Test Mode	**Description**
Mode 1	RF Link Mode

For Conducted Test	
Final Test Mode	Description
Mode 1	RF Link Mode

For EMS Test	
Final Test Mode	**Description**
Mode 1	RF Link Mode

1.6 Performance Criterion

The product family of Short Range Devices is divided into three classes of equipment, each having its own set of minimum performance criteria. This classification is based upon the impact on persons and/or goods in case the equipment does not operate above the specified minimum performance level under EMC stress.

Class of SRD equipment	Risk assessment of receiver performance
1	Highly reliable SRD communication media; e.g. serving human life Inherent systems (may result in aphysical risk to a person)
2	Medium reliable SRD communication media; e.g. causing inconvenience to persons, which cannot simply be overcome by other means
3	Standard reliable SRD communication media; e.g. inconvenience to persons, which can simply be overcome by other means(e.g. manual)

The equipment belongs to Class 3.

According to **ETSI EN 301 489-3** standard, the general performance criteria as following:

Class 1 SRD equipment		
Criterion	**During Test**	**After test**
A	Operate as intended No loss of function For equipment type Ⅱ the minimum performance shall be 12 dB SINAD No unintentional responses	Operate as intended For equipment type Ⅱ the communication link shall be maintained No loss of function No degradation of performance No loss of stored data of user programmable functions
B	May be loss of function (one or more) No unintentional transmissions	Operate as intended Loss function(s) shall be self-recoverable No degradation of performance No loss of stored data or user

		programmable functions
Class 2 SRD equipment		
Criterion	**During Test**	**After test**
A	Operate as intended No loss of function For equipment type Ⅱ the Minimum performance shall be 6 dB SINAD No unintentional responses	Operate as intended For equipment type Ⅱ the communication link shall be maintained No loss of function No degradation of performance No loss of stored data of user programmable functions
B	May be loss of function (one or more) No unintentional transmissions	Operate as intended Loss function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions
Class 3 SRD equipment		
Criterion	**During Test**	**After test**
A and B	May be loss of function(one or more) No unintentional responses	Operate as intended, for equipment type Ⅱ the communication link shall be may be lost, but shall be recoverable by user No degradation of performance Lost functions shall be self-recoverable

1.7 The Requirement of Performance Criteria

1	Performance criteria for continuous phenomena applied to transmitters (CT)	Criterion A of the applicable class shall apply
2	Performance criteria for transient phenomena applied to transmitters (TT)	Criterion B of the applicable class shall apply
3	Performance criteria for continuous phenomena applied to receivers (CR)	Criterion A of the applicable class shall apply
4	Performance criteria for transient phenomena applied to transmitters (TR)	Criterion B of the applicable class shall apply

1.8 Test Facility

The testing reports were performed by the Shenzhen STONE Testing Technology Co., Ltd., in their facilities located at:
F/6, Bldg.12, Zhongxing Industrial City, Chuangye Rd., Nanshan District, Shenzhen, Guangdong, China
Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.
FCC Registered No.: 323508 IC Registered No.:11043A-1

2 Test Results Summary

Test procedures according to the technical standards:

EMC Emission				
Standard	**Test Item**	**Limit**	**Judgment**	**Remark**
EN 55022: 2010	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	
EN 61000-3-2:2006+A 1:2009+A2:2009	Harmonic Current Emission	Class A or D NOTE(2)	PASS	
EN 6000-3-3:2008	Voltage Fluctuations& Flicker		PASS	

EMC Immunity				
Section	**Test Item**	**Performance Criteria**	**Judgment**	**Remark**
EN 61000-4-2: 2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006 +A1:2008+A2:2010	RF electromagnetic field	A	PASS	
EN 61000-4-4:2004 +A1:2010	Fast transients	B	PASS	
EN 61000-4-5:2006	Surges	B	PASS	
EN 61000-4-6: 2009	Injected Current	A	PASS	
EN 61000-4-11: 2004	Volt. Interruptions Volt. Dips	B/B / C / C NOTE (3)	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2) The power consumption of EUT is less than 75W and no Limits apply.

(3)Voltage dip: 100% reduction – Performance Criteria B

Voltage dip: 100% reduction – Performance Criteria B

Voltage dip: 70% reduction – Performance Criteria C

Voltage Interruption: 0% Interruption – Performance Criteria C

3 Test Equipment Used

3.1 Test Equipment Used to Measure Conducted Emission

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	Aug.10, 2013	1 Year
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	Aug.10, 2013	1 Year
AMN	SCHWARZBECK	NNBL 8226-2	Aug.10, 2013	1 Year
LISN	Rohde & Schwarz	ENV216	Aug.10, 2013	1 Year

3.2 Test Equipment Used to Measure Radiated Emission

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	Dec.31, 2013	1 Year
Spectrum Analyzer	Agilent	E4407B	Dec.31, 2013	1 Year
EMI Test Receiver	ROHDE& SCHWARZ	ESCI	Dec.31, 2013	1 Year
Bilog Antenna	SCHWARZBECK	VULB9168	Feb.12, 2013	1 Year
Horn Antenna	SCHWARZBECK	BBHA 9120D	Feb.12, 2013	1 Year
Horn Antenna	SCHWARZBECK	BBHA 9170	Feb.12, 2013	1 Year
Pre-amplifier	SCHWARZBECK	BBV9743	Oct. 31, 2013	1 Year
Pre-amplifier	Quietek	AP-180C	Oct. 31, 2013	1 Year
Bilog Antenna	SCHWARZBECK	VULB9163	Feb.12, 2013	1 Year
Signal Generator	ROHDE& SCHWARZ	SML03	Feb.12, 2013	1 Year
Positioning Controller	C&C	CC-C-1F	N/A	N/A

3.3 Test Equipment Used to Measure Magnetic Emission

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	Aug.10, 2013	1 Year
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	Aug.10, 2013	1 Year
Triple-Loop Antenna	EVERFINE	LLA-2	Aug.10, 2013	1 Year

3.4 Test Equipment Used to Power Clamp

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	Aug.10, 2013	1 Year
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	Aug.10, 2013	1 Year
Power Clamp	LUTHI	MDS21	Aug.15, 2013	1 Year

3.5 Test Equipment Used to Measure Harmonic Current/ Voltage Fluctuation and Flicker

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
Harmonic Flicker Test System	CI	5001ix-CTS-400	Aug.10, 2013	1 Year

3.6 Test Equipment Used to Measure Electrostatic Discharge Immunity

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
ESD Tester	TESEQ	NSG437	Aug. 13, 2013	1 Year

3.7 Test Equipment Used to Measure Conducted Immunity

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
RF Generator	FRANKONIA	CIT-10/75	Aug. 13, 2013	1 Year
Attenuator	FRANKONIA	59-6-33	Aug.10, 2013	1 Year
M-CDN	LUTHI	M2/M3	Aug.10, 2013	1 Year
AF2-CDN	LUTHI	AF2	Aug.10, 2013	1 Year
EM Injection Clamp	LUTHI	EM101	Aug.10, 2013	1 Year

3.8 Test Equipment Used to Measure Radio Frequency Electromagnetic Fields Immunity

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
Signal Generator	Rohde & Schwarz	SMT03	Feb.12, 2013	1 Year
Power Meter	Rohde & Schwarz	NRVD	Feb.12, 2013	1 Year
Voltage Probe	Rohde & Schwarz	URV5-Z2	Feb.12, 2013	1 Year
Voltage Probe	Rohde & Schwarz	URV5-Z2	Feb.12, 2013	1 Year

Power Amplifier	AR	150W1000	Feb.12, 2013	1 Year
Bilog Antenna	Chase	CBL6111C	Feb.12, 2013	1 Year

3.9 Test Equipment Used to Measure Electrical Fast Transient/Burst Immunity

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
Simulator	EMTEST	UCS500N5	Aug.10, 2013	1 Year
Auto-transforme r	EMTEST	V4780S2	Aug.10, 2013	1 Year

3.10 Test Equipment Used to Measure Surge Immunity

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
Simulator	EMTEST	UCS500N5	Aug.10, 2013	1 Year
Coupling Clamp	EMTEST	HFK	Aug.10, 2013	1 Year

3.11 Test Equipment Used to Measure Voltage Dips and Interruptions Immunity

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
Simulator	EMTEST	UCS500N5	Aug.10, 2013	1 Year
Auto-transfor mer	EMTEST	V4780S2	Aug.10, 2013	1 Year

3.12 Test Equipment Used to Measure Power frequency magnetic field

Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
Power Frequency Magnetic Field Generator	EVERFINE	EMS61000-8K	Aug.10, 2013	1 Year

4 Conducted Disturbance test

4.1 Test Standard and Limit

4.1.1 Test Standard

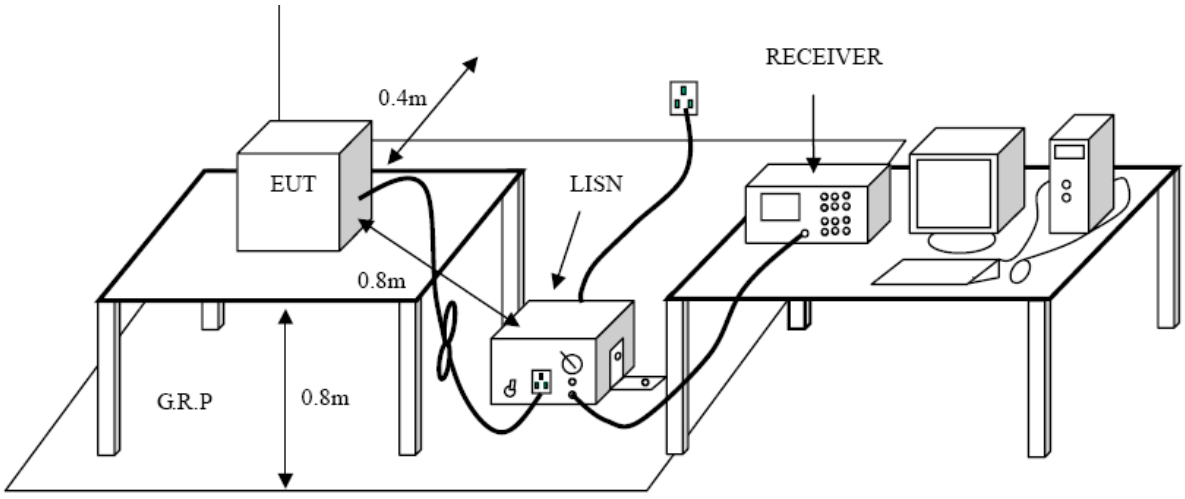
ETSI EN 301 489-1 Clause 8.4.2
ETSI EN 301 489-3
EN 55022: 2010 class B.

4.1.2 Test Limit

Conducted Disturbance Test Limit

Frequency	Maximum RF Line Voltage (DbμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50
Remark: *Decreasing linearly with logarithm of the frequency		

4.2 Test Setup



4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from the nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

4.4 Test Condition

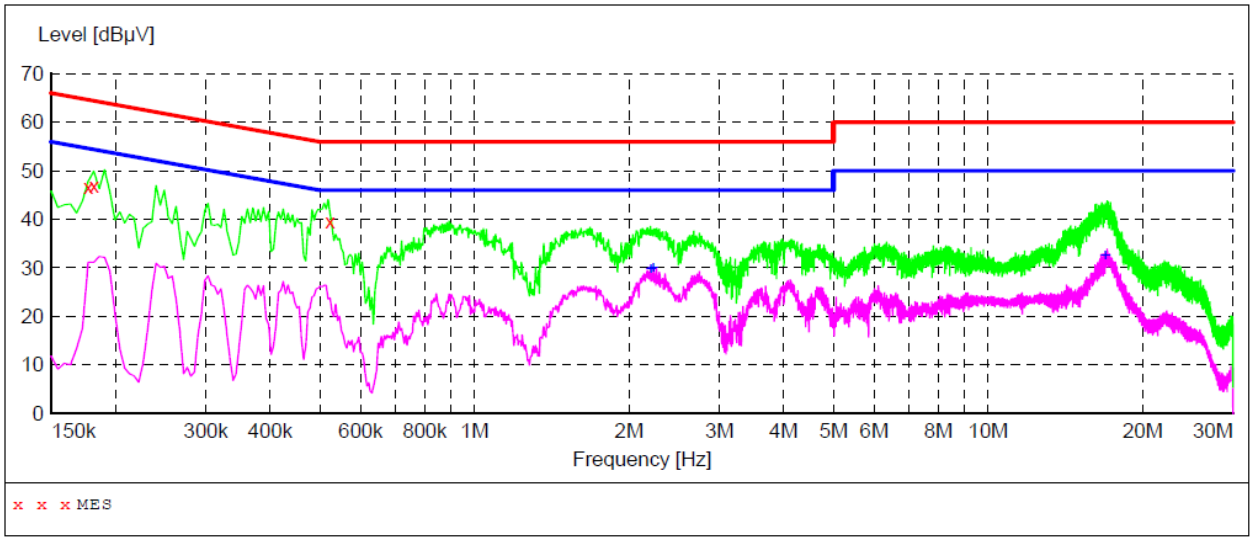
Temperature	:	25 ℃
Relative Humidity	:	48 %
Pressure	:	1010 hPa
Test Power	:	AC 230V/50 Hz

4.5 Test Data

Refer to next page.

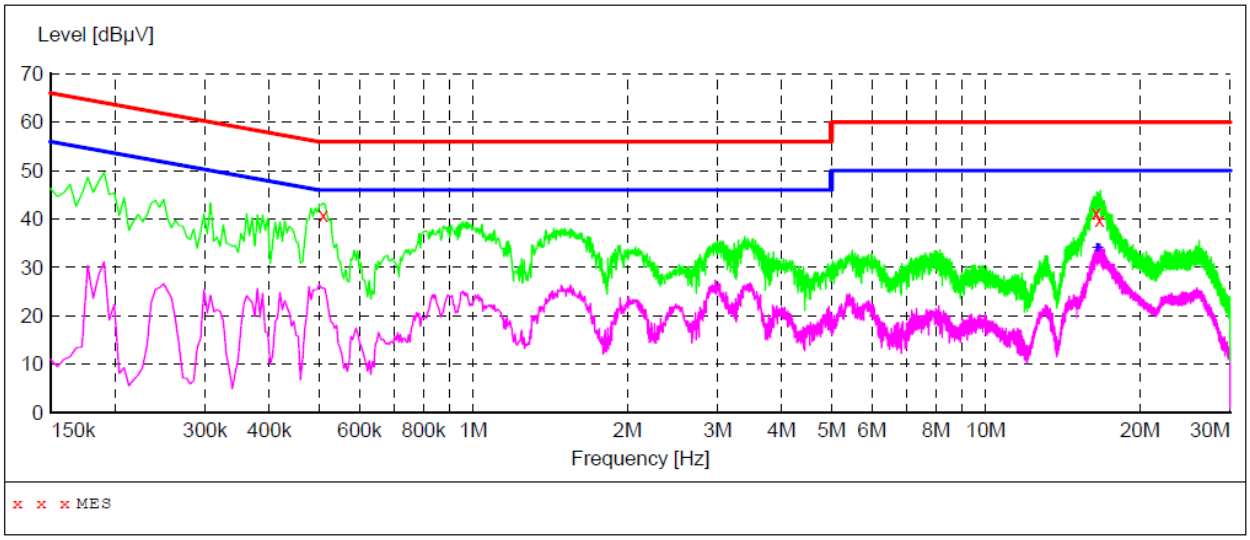
EUT：	Adapter	**Model Name :**	S70RPL001H
Temperature：	26°C	**Relative Humidity：**	60%
Pressure：	1010 hPa	**Test Voltage ：**	AC230V50HZ
Phase :	**L**		
Test Mode ：	Mode 1		

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177000	46.70	9.8	65	17.9	QP	L1	GND
0.181500	47.00	9.8	64	17.4	QP	L1	GND
0.523500	39.60	9.8	56	16.4	QP	L1	GND
2.202000	29.70	9.9	46	16.3	AV	L1	GND
2.229000	29.90	9.9	46	16.1	AV	L1	GND
16.921500	32.50	10.3	50	17.5	AV	L1	GND



EUT：	Adapter	**Model Name :**	S70RPL001H
Temperature：	26°C	**Relative Humidity：**	60%
Pressure：	1010 hPa	**Test Voltage ：**	AC230V50HZ
Phase :	**N**		
Test Mode ：	Mode 1		

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.510000	40.80	9.8	56	15.2	QP	N	GND
16.435500	41.30	10.3	60	18.7	QP	N	GND
16.683000	39.70	10.3	60	20.3	QP	N	GND
16.476000	34.00	10.3	50	16.0	AV	N	GND
16.602000	34.00	10.3	50	16.0	AV	N	GND



5 Radiated Disturbance Test

5.1 Test Standard and Limit

5.1.1 Test Standard

ETSI EN 301 489-1 Clause 8.2.2
ETSI EN 301 489-3
EN 55022:2010 class B

5.1.2 Test Limit

Radiated Disturbance Test Limit

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 – 230	40	30
230 – 1000	47	37

Notes:
(1) The limit for radiated test was performed according to as following: EN 55022
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Limits of Radiated Emission Measurement (Above 1000MHz)

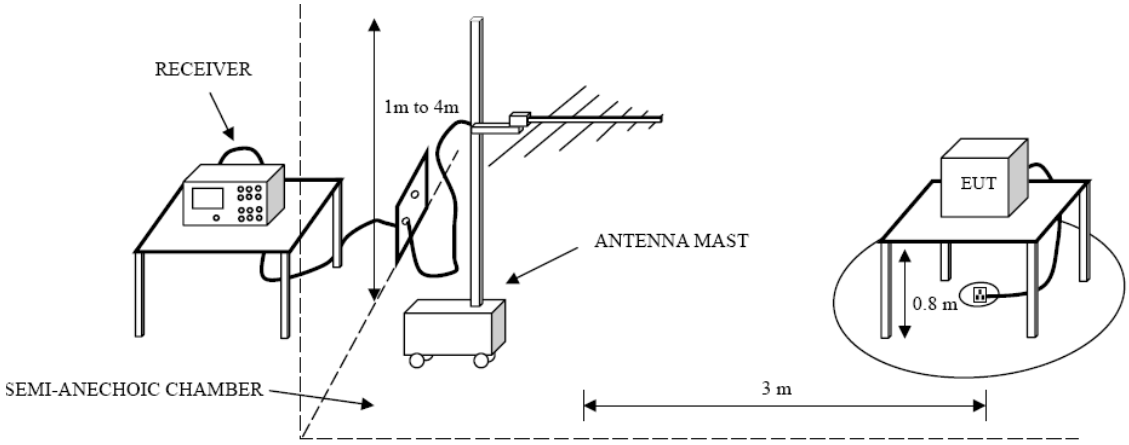
FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
1000-3000	76	56	70	50
3000-6000	80	60	74	54

Notes:
(1) The lower limit applies at the transition frequency.

Frequency Range of Radiated Measurement

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 6 GHz, whichever is lower

5.2 Test Setup



5.3 Test Procedure

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m. The table was rotated 360 degrees to determine the position of the highest radiation.

The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

The initial step in collecting radiated emission data is a spectrum Quasi Peak detector mode scanning the measurement frequency range.

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

5.4 Test Condition

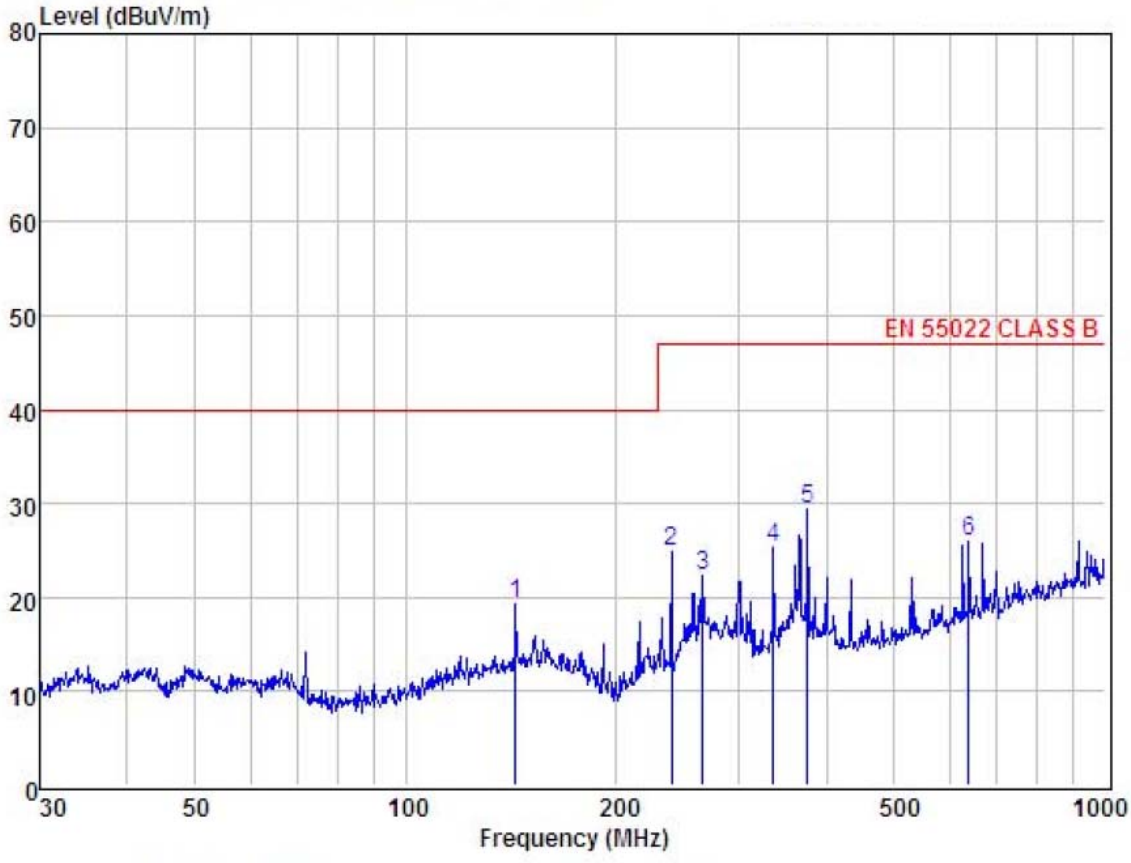
Temperature	:	25 ℃
Relative Humidity	:	48 %
Pressure	:	1010 hPa
Test Power	:	230Vac50Hz

5.5 Test Data

Please refer to the following pages.

(1) Bellow 1 G

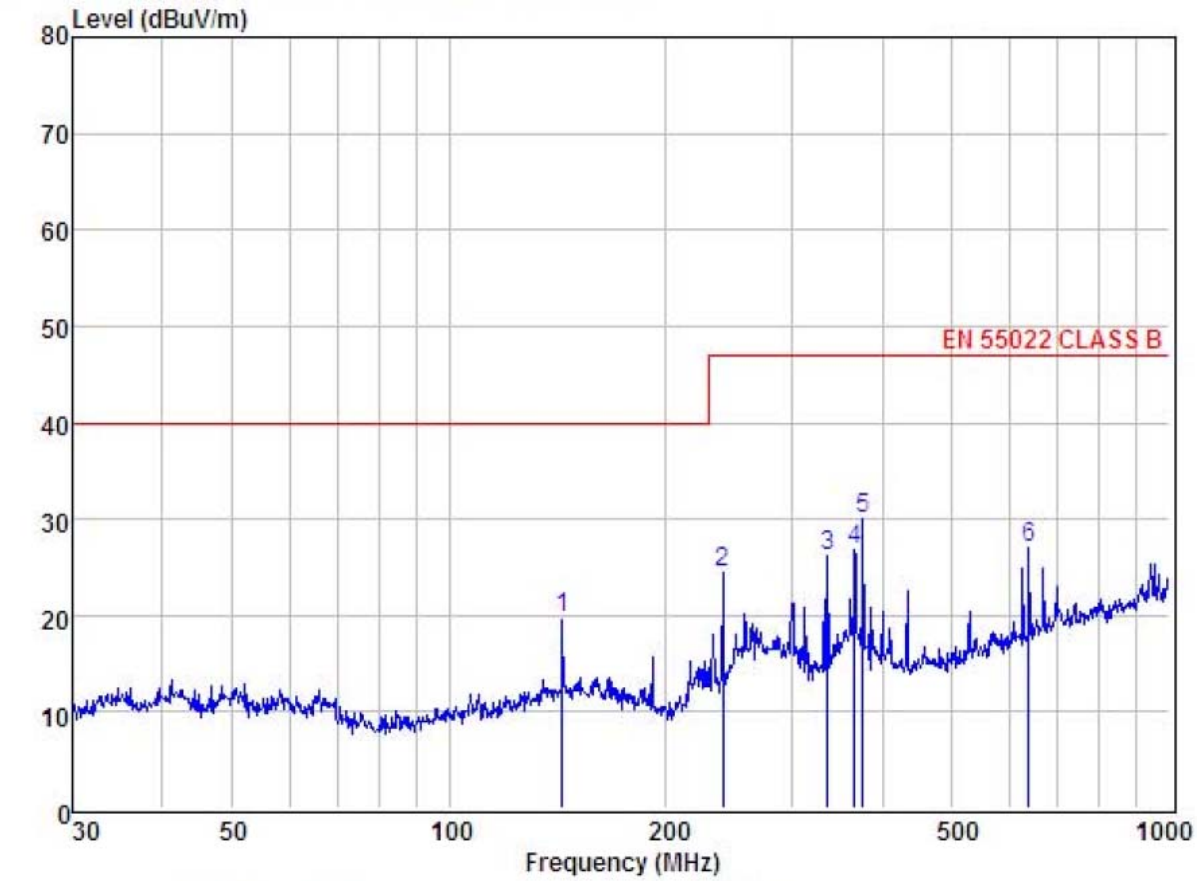
EUT：	Adapter	**Model Name :**	S70RPL001H
Temperature：	26°C	**Relative Humidity：**	60%
Pressure：	1010 hPa	**Test Voltage ：**	AC230V50HZ
Antenna Pol.	Horizontal		
Test Mode ：	Mode 1		



Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	143.83	31.96	13.77	26.90	0.38	19.21	40.00	-20.79	Peak
2	239.99	39.98	11.45	27.09	0.53	24.87	47.00	-22.13	Peak
3	265.68	36.76	11.96	27.13	0.61	22.20	47.00	-24.80	Peak
4	336.04	38.17	13.61	27.25	0.78	25.31	47.00	-21.69	Peak
5	375.94	41.45	14.35	27.35	0.96	29.41	47.00	-17.59	Peak
6	638.37	33.70	18.94	27.82	1.22	26.04	47.00	-20.96	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

EUT：	Adapter	**Model Name :**	S70RPL001H
Temperature：	26°C	**Relative Humidity：**	60%
Pressure：	1010 hPa	**Test Voltage ：**	AC230V50HZ
Antenna Pol.	Vertical		
Test Mode ：	Mode 1		



Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	143.83	32.53	13.77	26.90	0.38	19.78	40.00	-20.22	Peak
2	239.99	39.65	11.45	27.09	0.53	24.54	47.00	-22.46	Peak
3	336.04	39.00	13.61	27.25	0.78	26.14	47.00	-20.86	Peak
4	365.54	39.10	14.16	27.32	0.78	26.72	47.00	-20.28	Peak
5	375.94	42.15	14.35	27.35	0.96	30.11	47.00	-16.89	Peak
6	638.37	34.74	18.94	27.82	1.22	27.08	47.00	-19.92	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

(2) Above 1 G

EUT：	Adapter	**Model Name :**	S70RPL001H
Temperature：	26°C	**Relative Humidity：**	60%
Pressure：	1010 hPa	**Test Voltage ：**	AC230V50HZ
Test Mode ：	RF Link Mode		

Frequency (MHz)	Ant H / V	Measured (dBuV)	Limits (dBuV)	Margins (dB)	Detector	Note
1105.1100	H	38.52	70.00	31.48	Peak	
1105.1100	H	32.65	50.00	17.35	Avg	
---	H	---	---	---	---	
---	H	---	---	---	---	
---	H	---	---	---	---	
---	H	---	---	---	---	

Frequency (MHz)	Ant H / V	Measured (dBuV)	Limits (dBuV)	Margins (dB)	Detector	Note
1105.1000	V	35.74	70.00	34.26	Peak	
1105.1000	V	31.06	50.00	18.94	Avg	
---	V	---	---	---	---	
---	V	---	---	---	---	
---	V	---	---	---	---	
---	V	---	---	---	---	

6 Harmonic Current Emission Test

6.1 Test Standard and Limit

6.1.1 Test Standard

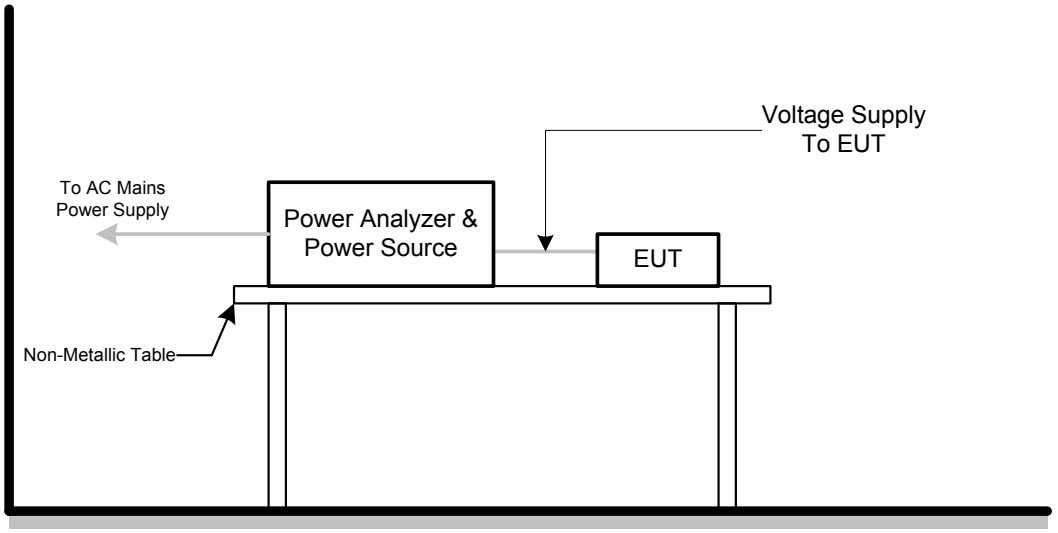
ETSI EN 301 489-1 Clause 8.5
ETSI EN 301 489-3
EN 61000-3-2

6.1.2 Limits

IEC 555-2					
Table-Ⅰ			Table-Ⅱ		
Equipment Category	**Harmonic order n**	**Max. permissible harmonic current (in Ampers)**	**Equipment Category**	**Harmonic order n**	**Max. permissible harmonic current (in Ampers)**
Non Portable Tools Or TV Receivers	**odd harmonics**		**TV Receivers**	**odd harmonics**	
	3	2.30		3	0.8
	5	1.14		5	0.65
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≥39	0.15·15/n		15≤n≥39	0.10·15/n
	even harmonics			**even harmonics**	
	2	1.08		2	0.30
	4	0.43		4	0.15
	8	0.30			
	8≤n≥40	0.23·8/n		DC	0.05

EN 61000-3-2					
Equipment Category	**Max. permissible harmonic current (in Ampers)**	**Equipment Category**	**Harmonic order n**	**Max. permissible harmonic current (in A)**	**(mA/w)**
Class A	Same as Limits Specified in Table Ⅰ But onlyodd Harmonics required	**Class D**	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			8≤n≥40	See Tabel Ⅰ	3.85/n
			Only odd harmonics required		

6.2 Test Setup



6.3 Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
The classification of EUT is according to section 5 of EN 61000-3-2: 2006.The EUT is classified as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

Class B: Portable tools. Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to600 W of the following types: Personal computers and personal computer monitors and television receivers.

6.4 Test Condition

Temperature	:	25 ℃
Relative Humidity	:	48 %
Pressure	:	1010 hPa
Test Power	:	AC 230V50Hz

6.5 Test Data

There is no need for Harmonics test to be performed on this equipment, for the reason the rated power is less than 75W.

7 Voltage Fluctuation and Flicker test

7.1 Test Standard and Limit

7.1.1 Test Standard

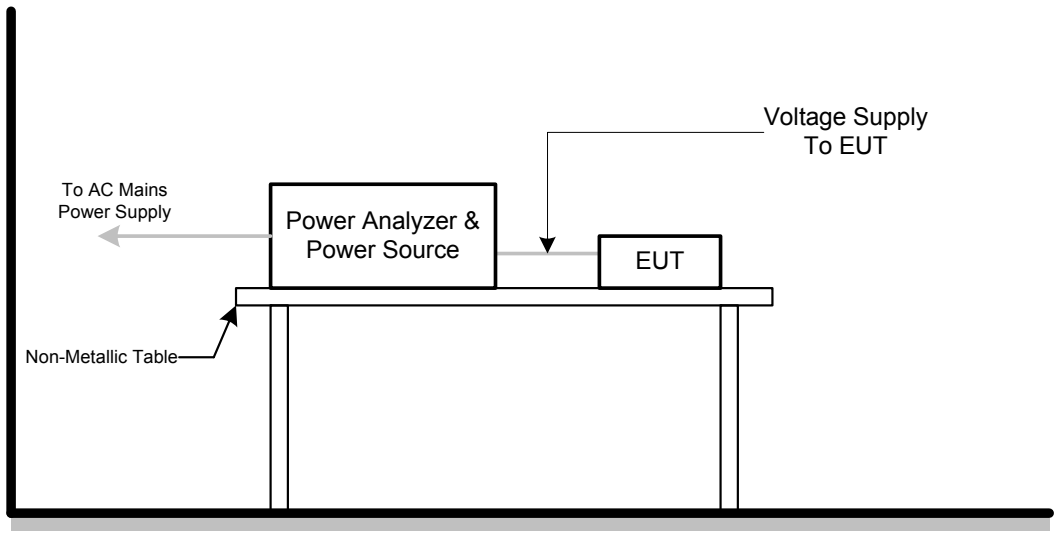
ETSI EN 301 489-1 Clause 8.6
ETSI EN 301 489-3
EN 61000-3-3

7.1.2 Limit

Flicker Test Limit

Tests	Limits		Descriptions
	IEC555-3	IEC 61000-3-3	
Pst	≤ 1.0, Tp= 10 min.	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	N/A	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3 %	≤ 3 %	Relative Steady-State V-Chang
dmax	≤ 4 %	≤ 4 %	Maximum Relative V-change
d (t)	N/A	≤ 3% for > 200 ms	RelativeV-change characteristic

7.2 Test Setup



7.3 Test Procedure

7.3.1 Fluctuation and Flickers Test:

Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.

7.3.2 All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

7.3.3 For the actual test configuration, please refer to the related Item –Block Diagram of system tested.

7.4 Test Condition

Temperature	:	25 ℃
Relative Humidity	:	48 %
Pressure	:	1010 hPa
Test Power	:	AC230V50Hz

7.5 Test Data

EUT：	Adapter	**Model Name :**	S70RPL001H
Temperature：	26°C	**Relative Humidity：**	60%
Pressure：	1010 hPa	**Test Voltage ：**	AC230V50HZ
Test Mode ：	RF Link Mode		

Maximum Flicker results

	EUT values	**Limit**	**Result**
Pst	0.028	1.00	PASS
Plt	0.029	0.65	PASS
dc [%]	0.012	3.30	PASS
dmax [%]	0.136	7.00	PASS
dt [s]	0.002	0.50	PASS

8 Electrostatic Discharge Immunity Test

8.1 Test Requirements

8.1.1 Test Standard

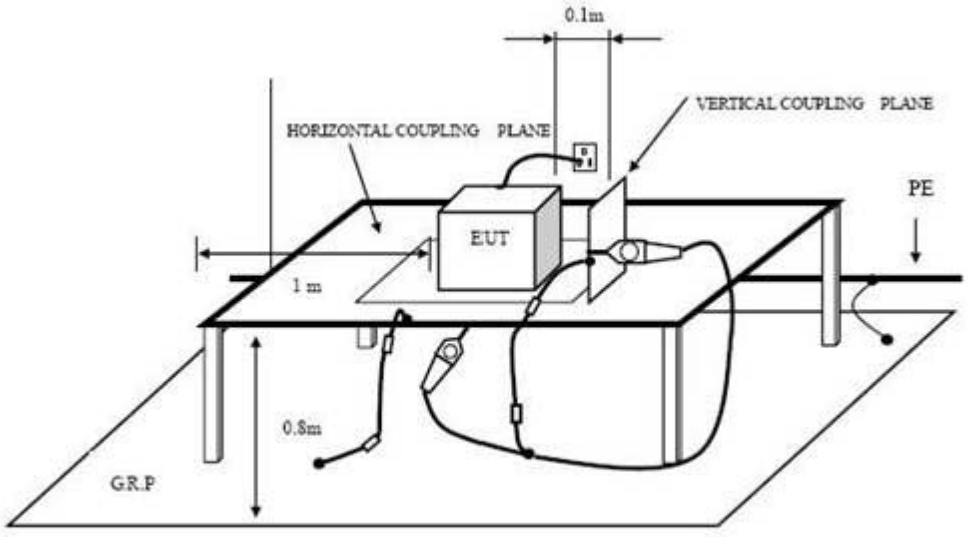
ETSI EN 301 489-1 Clause 9.3.2
ETSI EN 301 489-3
EN 61000-4-2

8.1.2 Test Level

Discharge Impedance:	330 ohm/ 150pF
Discharge Voltage:	Air Discharge：2kV/4kV/8kV(Direct) Contact Discharge: 2kV/4kV (Direct /Indirect)
Polarity:	Positive& Negative
Number of Discharge:	Air Discharge: min.20 times at each test point Contact Discharge: min.200 times in total
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

8.1.3 Performance criterion: B

8.2 Test Setup



INDIRECT DISCHARGE SETUP

8.3 Test Procedure

8.3.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

8.3.2 Contact Discharge:

All the procedure shall be same as air discharge. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

8.3.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

8.3.4 Indirect discharge for vertical coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

8.4 Test Data

Please refer to the following page.

Electrostatic Discharge Test Result

EUT :	Adapter	Model Name :	S70RPL001H
Temperature :	22℃	Humidity :	50%
Power supply :	AC230V50Hz	Test Mode :	Mode 1
Test Engineer :	Linna		

Criterion: B

Air Discharge: ±8kV Contact Discharge: ±4kV

For each point positive 10 times and negative 10 times discharge.

Location	**Kind** A-Air Discharge C-Contact Discharge	**Result**
Slot of the EUT	A	A
Buttons	A	A
LED Light	A	A
HCP	C	A
VCP of front	C	A
VCP of rear	C	A
VCP of left	C	A
Judgment	PASS	

Note:

1) Criteria A: There was no change operated with initial operating during the test.
2) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
3) Criteria C: The system shut down during the test.

9 Radiated Electromagnetic Field Immunity test

9.1 Test Requirements

9.1.1 Test Standard

ETSI EN 301 189-1 Clause 9.2.2
ETSI EN 301 489-3
EN 61000-4-3

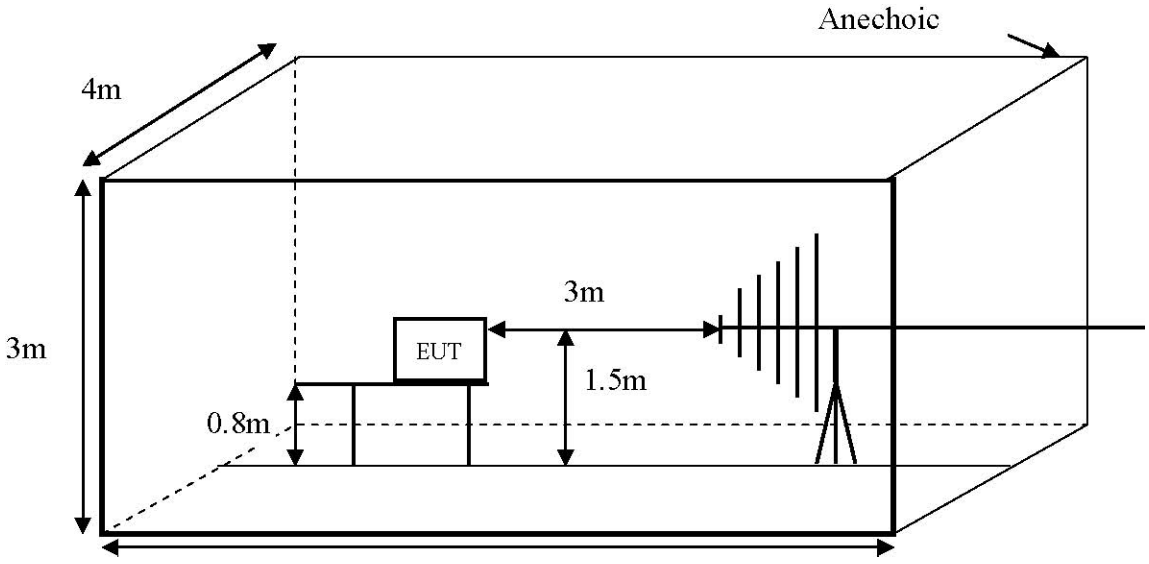
9.1.2 Test Level

Test Level for Radiated Electromagnetic Field Immunity Test

Port	Test Specification
Enclosure Port	80-1000MHz, and 1400-2700MHz 3 V/m 80 % AM (1kHz)

9.1.3 Performance criterion: A

9.2 Test Setup



9.3 Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a camera is used to monitor its screen.
All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	3V/m
2. Radiated Signal	80%AM,1kHz Since Wave
3. Scanning Frequency	80-1000MHz,1400-2700MHz
4. Sweep time of radiated	0.0015 Decade/s
5. Dwell Time	3 Sec.

9.4 Test Data

Please refer to the following page.

RF Field Strength Susceptibility Test Results

EUT :	Adapter	Model Name :	S70RPL001H
Temperature :	22℃	Humidity :	50 %
Field Strength :	3V/m	Criterion :	A
Power Supply :	AC230V50Hz	Test Mode :	Mode 1
Test Engineer:	Linna		

Modulation: ☐None ☐ Pulse ☒AM 1KHz 80%

	Frequency Rang 1:		Frequency Rang 2:	
	80~ 1000MHz		1400~2700MHz	
	Horizontal	Vertical	Horizontal	Vertical
Front	A	A	A	A
Right	A	A	A	A
Rear	A	A	A	A
Left	A	A	A	A
Judgment	PASS		PASS	

Note:
1) Criteria A: There was no change operated with initial operating during the test.
2) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
3) Criteria C: The system shut down during the test.

10 Electrical Fast Transient/Burst Test

10.1 Test Requirements

10.1.1 Test Standard

ETSI EN 301 489-1 Clause 9.4
ETSI EN 301 489-3
EN 61000-4-4:2004+A1:2010

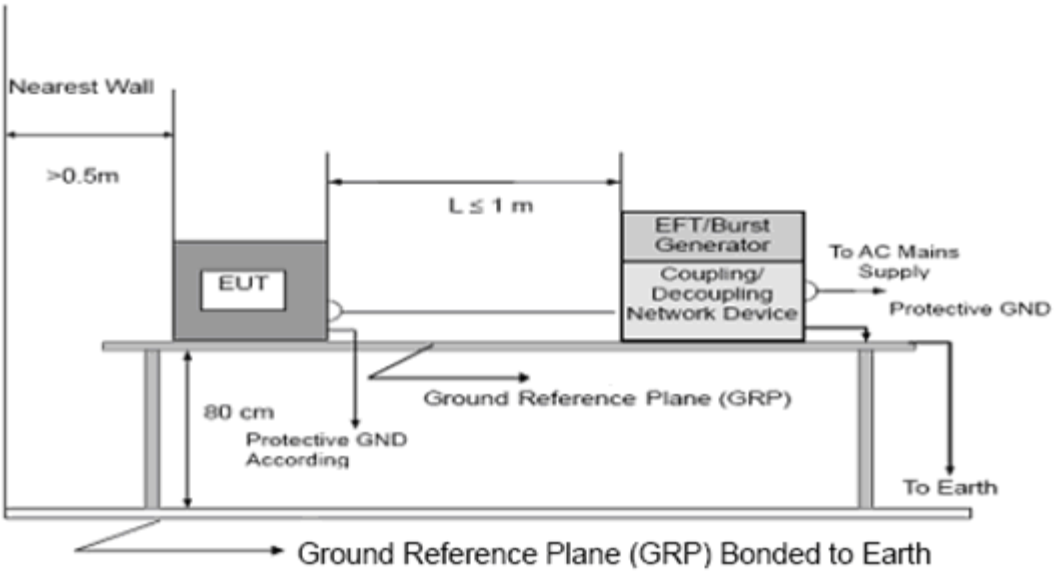
10.1.2 Test Level

Test Level for Electrical Fast Transient Test

	On Switching Adapter Lines	**On I/O (Input/Output) Signal data and control lines**
Test Voltage:	1 KV	0.5 KV
Polarity:	Positive& Negative	
Impulse Wave Shape:	5/50ns	
Burst Duration:	15ms	
Burst Period:	300ms	
Test Duration:	Not less than 1 min	

10.1.3 Performance criterion: B

10.2 Test Setup



10.3 Test Procedure

10.3.1 For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1minute.

10.3.2 For signal lines and control lines ports:

A coupling clamp is use to couple the EFT interference signal to the signal and control lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 minute.

10.3.3 For DC input and DC output power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to DC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 minute.

10.4 Test Data

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

EUT :	Adapter	Model Name :	S70RPL001H
Temperature :	22℃	Humidity:	50%
Power Supply :	AC 230V/50Hz	Criterion :	B
Test Engineer :	Ariel	Test Mode :	Mode1

Test Results Description

Line : ☒ AC Mains Line ☐ DC Power Line ☐ Signal ☐ I/O Cable

Test Level: ☒ 1KV ☐ 0.5KV

Port(s)	Polarity	Results	Judgment
Line(L)	P	A	PASS
	N	A	PASS
Neutral(N)	P	A	PASS
	N	A	PASS
Ground(PE)	P	A	PASS
	N	A	PASS
Signal /Control Line(LAN)	P	N/A	
	N	N/A	

Remark:

11 Surge Immunity Test

11.1 Test Requirements

11.1.1 Test Standard

ETSI EN 301 489-1 Clause 9.8
ETSI EN 301 489-3
EN 61000-4-5:2006

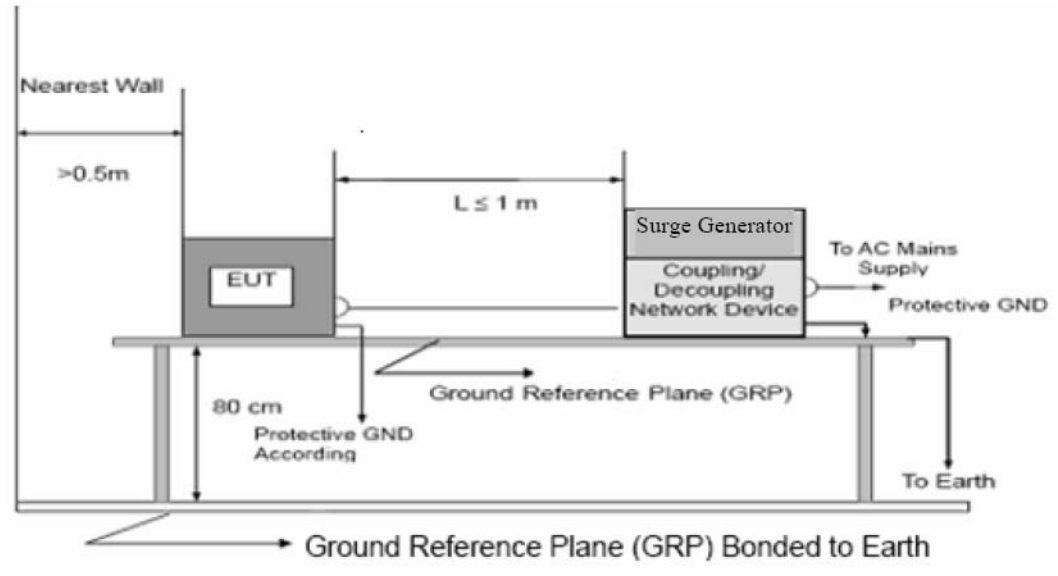
11.1.2 Level

Test Level for Surge Immunity Test

Basic Standard:	**EN 61000-4-5**
Wave-Shape:	Combination Wave 1.2/50us Open Circuit Voltage 8/20us Short Circuit Current
Test Voltage	Power Line:0.5kV,1kV,2kV
Surge Input/Output:	L1-l2,l1-PE,L2-PE
Generator Source:	2 ohm between networks
Impedance:	12ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0/90/180/270
Pulse Repetition Rate:	1 time/min.(maximum)
Number of Tests:	5 positive and 5 negative at selected points

11.1.3 Performance criterion: B

11.2 Test Setup



11.3 Test Procedure

11.3.1 Set up the EUT and test generator.

11.3.2 For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge

11.3.3 (at open-circuit condition) and 8/20us current surge to EUT selected points.

11.3.4 At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

11.3.5 Different phase angles are done individually.

11.3.6 Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

11.4 Test Data

Please refer to the following page.

Surge Immunity Test Results

EUT :	Adapter	Model Name :	S70RPL001H
Temperature :	22℃	Humidity:	50%
Power Supply :	AC 230V/50Hz	Criterion :	A
Test Engineer :	Linna	Test Mode :	Mode 1

Test Results Description

Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (KV)	Result
L-N	±	0	5	1.0	PASS
	±	90	5	1.0	PASS
	±	180	5	1.0	PASS
	±	270	5	1.0	PASS
L-PE	±	0	5	2.0	PASS
	±	90	5	2.0	PASS
	±	180	5	2.0	PASS
	±	270	5	2.0	PASS
N-PE	±	0	5	2.0	PASS
	±	90	5	2.0	PASS
	±	180	5	2.0	PASS
	±	270	5	2.0	PASS
Signal Line (N/A)	±	N/A		N/A	

Remark:

12 Injection Current Test

12.1 Test Requirements

12.1.1 Test Standard

ETSI EN 301 489-1 Clause 9.5
ETSI EN 301 489-3
EN 61000-4-6:2009

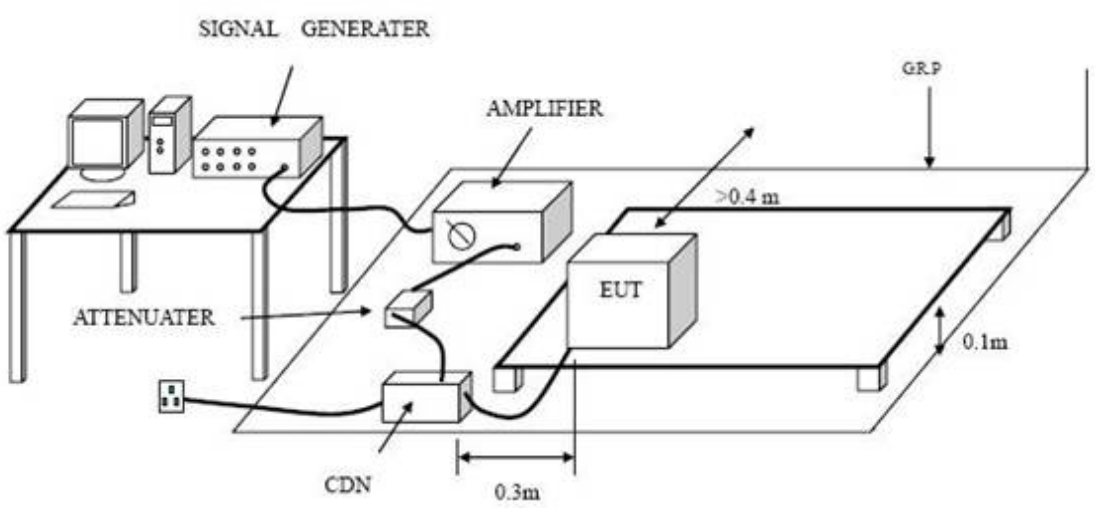
12.1.2 Test Level

Test Level for Conducted Immunity

Port	Test Specification
Input AC power port	0.15MHz~80MHz 3V(r.m.s.) (unmodulated)

12.1.3 Performance criterion: A

12.2 Test Setup



12.3 Test Procedure

12.3.1 Set up the EUT, CDN and test generators.

12.3.2 Let the EUT work in test mode and test it.

12.3.3 The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).

12.3.4 The disturbance signal description below is injected to EUT through CDN.

12.3.5 The EUT operates within its operational mode(s) under intended climatic conditions after power on.

12.3.6 The frequency range is swept from 0.150MHz to 230MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.

12.3.7 The rate of sweep shall not exceed 1.5*10-3decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

12.3.8 Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

12.4 Test Data

Please refer to the following page.

Injected Currents Susceptibility Test Results

EUT :	Adapter	Model Name :	S70RPL001H
Temperature :	22℃	Humidity:	50%
Power Supply :	AC 230V/50Hz	Criterion :	A
Test Engineer :	Linna	Test Mode :	Mode 1

Test Results Description				
Frequency Range (MHz)	Injected Position	Voltage Level (e.m.f.)	Result	Judgment
0.15 ~ 80	AC Mains	3V(rms),AM Modulated 1000Hz,80%	A	PASS
0.15 ~ 80	DC Mains	3V(rms),AM Modulated 1000Hz,80%	N/A	
0.15 ~ 80	Signal Mains	3V(rms),AM Modulated 1000Hz,80%	N/A	

Remark **:**

13 Voltage Dips and Interruptions Immunity Test

13.1 Test Requirements

13.1.1 Test Standard

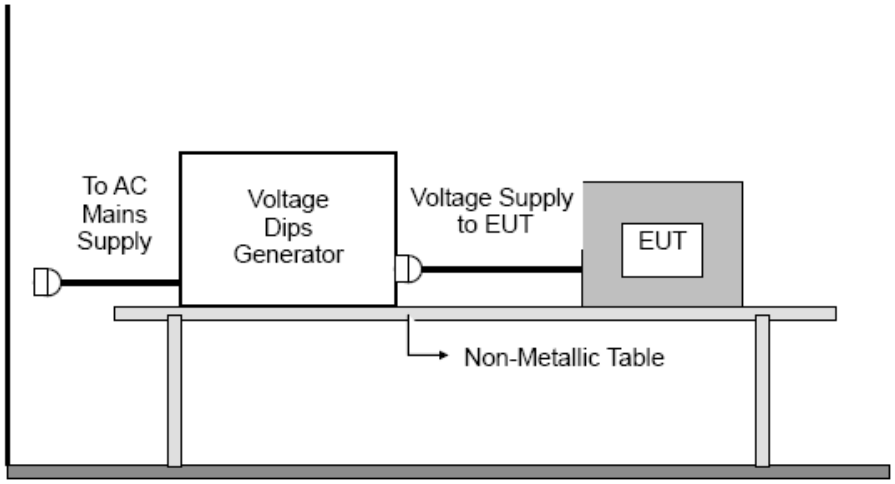
ETSI EN 301 489-1 Clause 9.7
ETSI EN 301 489-3
EN 61000-4-11:2004

13.1.2 Level

Test Level for Voltage Dips and Interruptions

Basic Standard:	**EN 61000-4-11**
Required Performance:	B(For 100% Voltage Dips) B(For 100% Voltage Dips) C(For 30% Voltage Dips) C(For 100% Voltage Interruptions)
Test Duration Time:	Minimum three test events in sequence
Interval Between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

13.2 Test Setup



13.3 Test Procedure

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event).

Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

13.4 Test Data

Voltage Dips and Interruptions Test Results

EUT :	Adapter	Model Name :	S70RPL001H
Temperature :	22℃	Humidity :	50%
Power Supply :	AC 230V/50Hz	Criterion :	B&C
Test Engineer :	Linna	Test Mode :	Mode 1

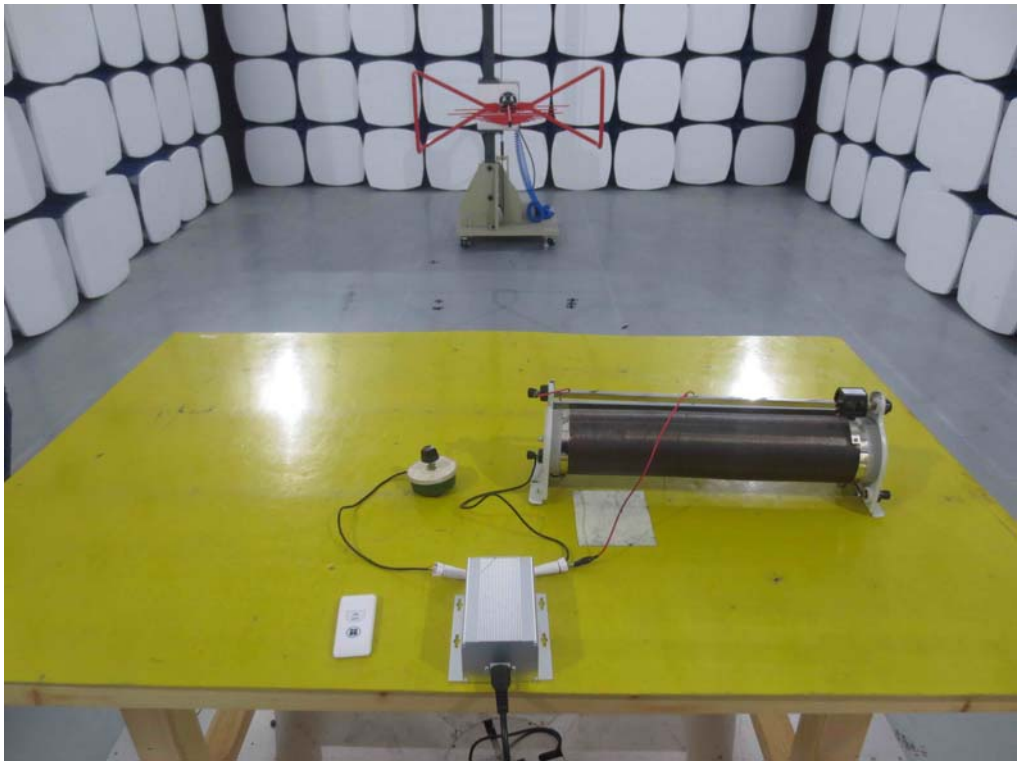
Test Results Description

Voltage Reduction	Cycles	Perform Criteria	Results	Judgment
Voltage dip 100%	0.5	B	A	PASS
Voltage dip 100%	1	B	A	PASS
Voltage dip 30%	25	C	B	PASS
Voltage Interruption100%	250	C	C	PASS

Remark:

14 Photographs – EUT Test Photos

Radiated Measurement Photos



Conducted Test Photos